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ABSTRACT

The practice of reforming failing schools through school reconstitution is one of the latest challenges for school system directors of evaluation and accountability. Failing schools are typically identified in terms of student test performance. However, evaluating the impact of reconstitution in terms of test score gains may not be an appropriate methodology for the short run. Instead, evaluators should consider multilevel evaluation models that account for those school input factors that were reconstituted, i.e., teaching staff and class size,. The position is taken that it is vital to delineate, obtain, and report information on teacher and class size variables in an evaluation of school reconstitution reform. This paper attempts to define the nature of the school reconstitution evaluation problem, relate teacher experience/training and class size to school reform, delineate operational definitions for obtaining standardized teacher and class size variables, and show some descriptive and correlation results for these variables. (Contains 3 tables and 16 references.) (Author/SLD)

Jump Higher or Else! Measuring School Reconstitution[1]

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Abstract: The practice of reforming failing schools through school reconstitution is one of the latest challenges for school system directors of evaluation and accountability. Failing schools are typically identified in terms of student test performance. However, evaluating the impact of reconstitution in terms of test score gains may not be an appropriate methodology for the short run. Instead, evaluators should consider multilevel evaluation models which account for those school input factors which were reconstituted, i.e., teaching staff and class size. The authors take the position that it is vital to delineate, obtain and report information on teacher and class size variables in an evaluation of school reconstitution reform. This paper attempts to define the nature of the school reconstitution evaluation problem, relate teacher experience/training and class size to school reform, delineate operational definitions for obtaining standardized teacher and class size variables, and show some descriptive and correlation results for these variables.

The practice of reforming failing schools through school reconstitution is one of the latest challenges for school district directors of evaluation and accountability. Because schools are targeted for reconstitution based on low test scores, increased academic achievement is the primary goal of the reconstitution reform. However, an evaluation design which relies on student test scores may not be the best method for assessing the impact caused by reconstitution.

Employing case study methodology to examine the reconstitution impact on a school's resources, governance methods, school-community relations, organizational infrastructure and instructional programs is an alternative design with many admirers (Finkelstein, et. al.,1998). Case study methodology can capture the ways in which schools have interpreted and reacted to reconstitution. This important information, however, is very costly to collect, frequently criticized as subjective, not amenable to shorthand quantitative presentations, and generally out of reach of most school district directors of evaluation.

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Another alternative is to broaden the focus of the evaluation on student test scores to include those input factors which are the primary result of the reconstitution effort, namely the teaching staff and class size. Following Stufflebeam's CIPP model, this initial focus on program input evaluation will secure information needed to appraise the teacher and class size changes resulting from the school reconstitution.[2] The input evaluation task is to ascertain the nature of available capabilities resulting from the staffing reconstitution and determine the potential for achieving the needed student academic gains which identified the school for reform in the first place. The input evaluator's task is to delineate those teacher and class variables which accurately reflect the reconstitution effort, obtain data which measure the delineated teacher and class variables, and provide analysis information needed for decisions regarding which instructional resources to use and in what manner they should be employed in order to promote achievement of the reconstitution objective identified, namely student academic gains.

Educators and researchers know that the placement of better teachers in a school is one of the most influential determinants to student achievement that is under the reconstitution control of school officials (Phillips and Adcock, 1997; Wright, Horn, & Sanders, 1997). Reconstituting schools, however, is not necessarily the same thing as improving the teaching faculty or the teaching situation. It would not be reasonable, for example, to expect student achievement gains in reconstituted schools that do not accrue measurable improvements in the school's teaching capacity or classroom teaching situation. Consequently, it is the position of the authors that a school district accountability system for evaluating the impact of a school reconstitution reform program should first measure inputs in terms of improvements in school teaching capacity and classroom teaching situations.

From the perspective of the office of Research, Evaluation and Accountability (REA) in a large public school system that has reconstituted failing schools, this paper attempts to:

- describe the nature of the school reconstitution program as implemented in the Prince George's County Public Schools' (PGCPS) system;
- review the rationale for including teacher experience/training and class size indicators into an accountability system for evaluating school reconstitution reform;
- provide operational definitions for teacher and class variables; and
- show some descriptive and correlation results for these variables

BACKGROUND: SCHOOL RECONSTITUTION IN PGCPS

The schools in the Prince George's County Public Schools' (PGCPS) system are accountable to two agencies, State and Local, which may target them for reconstitution. Both

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[2] Daniel Stufflebeam and Egon Guba originated the CIPP Model which is an acronym representing the four types of evaluation this model identifies, namely, *context* evaluation, *input* evaluation, *process* evaluation, and *product* evaluation.

accountability systems share a primary emphasis on student test performance for their school reconstitution selection and evaluation process. The pressures on PGCPS from the State accountability program peaked in the late 1990s, when the State threatened to reconstitute schools if their performance did not improve. In the Spring of 1997, the district superintendent, in concert with the Board of Education of the Prince George's County Public Schools' (PGCPS) system initiated a local school reconstitution process for six of the system's lowest performing schools entitled: "The *21st Century Schools Initiative.*" The reform "was created for the purpose of significantly improving the academic achievement of students enrolled in these schools." The reform called for a near total reconstitution of the administration, instructional, and building support staff at these six schools. It is this local *21st Century Schools Initiative* school reconstitution that is the focus of this paper.

The primary selection criteria for failing school status was low and declining performance in State mandated tests. The Maryland State Department of Education's (MSDE) accountability program measures school status differently at each school level (i.e., elementary, middle, and high school). At the elementary school level, the primary performance measure for school accountability status is calculated by aggregating third- and fifth-grade student test performance relative to a "satisfactory" standard on constructed performance assessments in six content areas (language usage, mathematics, reading, science, social studies, and writing) along with attendance. The middle school status is calculated by aggregating eighth grade test performance in the same six content areas, along with attendance and the middle school's "graduates" performance on the ninth grade Maryland Functional Mathematics, Reading, and Writing Tests. The high school accountability status is calculated by aggregating student performance, in both the ninth and eleventh grades, on the Maryland Citizenship Test and the Functional Mathematics, Reading, and Writing Tests along with daily attendance and dropout data.

Based upon this school performance accountability system, the *21st Century Schools Initiative* identified six schools (four elementary and two middle schools) for reconstitution. The *21st Century Schools Initiative* called for a complete overhaul of instructional staff at each of the sites. More specifically, it (1) recalled all teachers and administrators in each of the six schools; (2) required all staff that sought positions in the six 21st Century Schools to apply (or reapply) and to be interviewed; and (3) guaranteed positions within the county for all teachers who had previously taught in the 21st Century Schools. An extensive case study of the first year *21st Century Schools Initiative* implementation, conducted by an Interdisciplinary Education Policy-Study Team from the University of Maryland, reported that the initiative virtually "cleaned the slate" of staff in the six sites targeted for reconstitution (Finkelstein, et. al, 1998).

The Superintendent explained the staff restructuring in a July 1, 1997 memorandum as a means to provide these six schools with a new group of teachers and new principals that "...will willingly 'break the mold' to pose unique and inventive solutions to problems; that they will be data-driven in their assessments of 'what works;' and that they will always take actions that are in the best interests of children." While new staff were hired at all school sites, it is not clear whether additional positions were created or that additional dollars were spent on refilled staff

positions as a result of the *21st Century Schools Initiative*. A case study investigation conducted by a University of Maryland Interdisciplinary Education Policy Study Team found that the 21st Century Schools sites did receive new resource allocations for staff development and monies structured to support educational programs and tuition supplements for teachers pursuing Master's degrees, formal certification, and general education (Finkelstein, et al., 1998).

While the benefits of staff development activities remains questionable in the literature, research continues to demonstrate that teacher experience and academic training prior to engagement in such instructional challenges as school reform practices is of vital importance. The next section presents a brief review of the literature on the relationship of teacher experience and academic training.

TEACHER TRAINING/EXPERIENCE AND CLASS SIZE INDICATORS

Research on class size and teachers has been particularly plagued by a variety of methodological and definition problems. Early research in these areas relied on macro-level data that had been aggregated at levels far from the classroom (e.g., district and state). More recent research that is defining class size in terms of classroom teachers and using value-added analysis methodology at the school and teacher levels is yielding robust results which reveal strong evidence of a teacher effect and mixed results on class size effect.

Hanushek's classic 1986 review of production function studies found that most indicator research includes three school inputs that are the largest determinants of instructional expenditures — teacher experience, teacher education, and class size. Ferguson's 1991 district-level regression analysis study using almost 900 school districts in Texas linked student test performance in reading to teachers' language skill. Ferguson's analysis revealed that after teachers' language skills, the next most important school characteristic in promoting children's reading performance is teacher experience, followed by class size and the proportion of teachers with master's degrees. In support of Hanushek's earlier observations, Ferguson's study demonstrated with empirical estimates at the school district level that teachers' tested skill level, teacher years of experience, class size and teachers' college training are important variables for empirical studies of "quality schooling" and "best practices."

The PGCPS school-level findings from value-added research with 120 elementary schools are consistent with Ferguson's 1991 district-level regression analysis study. Using school-wide aggregated data, Phillips and Adcock (1996) and Adcock and Phillips (1997) found that elementary students' test performance on a statewide accountability measure in reading was linked to the average college training level of classroom teaching staff and, to a much lesser degree, the average class size for a school. Modeling the district data as a two-level students-nested-within-school structure showed that the teacher college training level and class size input variables impacted students' reading test scores. Moreover, the impact of college training level of the school's teaching staff and average class size were independent of students' family income, mobility and minority status.

More recently, Wright, Horn, and Sanders (1997) conducted a large-scale longitudinal teacher-level study as a component of the Tennessee Value-Added Assessment System (TVAAS). Sanders et al., found that teacher effects are the dominant factors affecting student academic gain and that class sizes have relatively little influence on academic gain. The February 18, 1998 edition of *Education Week* reports that Mendro and his team of researchers in the Dallas district have replicated and extended the Tennessee research work. They used a value-added hierarchical two-stage, two-level student-within-teacher analysis model that demonstrated strong links between students' assessment performance and teachers' measured skill level effects in a large-scale study of 1,500 teachers. The studies from the state of Tennessee and the Dallas school district represent the most extensive empirical application of value-added research methodology at the teacher-level in the country.

In summary, the research continues to underscore the dramatic effects skilled teachers have on student performance, but the findings on class size is less impressive. Yet, one of the best known "common knowledge" ways to improve student learning is to reduce class size. As presented in this section, educational researchers have long sought to find evidence to support or refute this claim (Glass et al., 1982; Hanushek, 1986; Ferguson, 1991; and Word, 1990). As researchers increasingly use more robust methodology and standardize variable definitions for teachers and class size, the evidence reveals a class size effect, especially for the earlier grades. Most of the articles and studies emphasize that in order to experience student achievement gains, positive changes must occur in teaching practices along with the reduction in class size. In any regard, the research implications for school reconstitution clearly point to a need for providing decision makers with the input evaluation information on teacher and class size capability improvements which have resulted from the reform initiative.

DATA DEFINITION FOR TARGETED INDICATORS

The literature shows that teacher experience, teacher education and class size are important school level input variables for school reform evaluations. This is especially true for school reconstitution programs that target changes in teaching staff and class size as the primary instrument of reform. Assessing the impact of these school input variables is complicated by definitions, data processing and reporting issues. While most observers believe they know who a "teacher" is, and certainly could recognize a "class" when they are looking at one, it is quite another matter to extract such school input variables from school district databases for evaluation purposes.

Having convincing evidence that school reconstitution evaluation needs to include teacher and class size input variables into the analysis is one thing; however, "doing the data" with sufficient scientific rigor to support multilevel analysis modeling is quite another. Data is expensive, and evaluation quality data is very expensive. Two highly readable first introductions for transforming school district legacy data into evaluation quality data is presented in papers by Haseltine, Adcock and Winkler (1998) and Adcock and Phillips (1997).

The National Center of Educational Statistics (NCES) has produced a seminal document for the standardization of school district data in the form of their 1991 publication on "Standards for Education Data Collection and Reporting" (SEDCAR). The SEDCAR provides a comprehensive guide for state and local education agencies for collecting, processing and reporting school system data elements and variables. Unfortunately, armed with even these excellent "how to" guides, Blank (1993) points out that evaluators still face many hurdles which impede the development of a system to collect, process and report target indicator data from the typical school district legacy data management system.

Despite the difficulties posed by the typical school district legacy data systems, district directors of evaluation need to find a way to delineate, collect, process and report teacher and class input data in order to provide meaningful evaluation information on the impact of school reconstitution reform. Using the SEDCAR data processing standards and related student and staff handbooks as guides for data definitions, the Research, Evaluation and Accountability (REA) office of the Prince George's County Public Schools (PGCPS) has developed the *Research and Evaluation Assimilation Database (READ)* support system for evaluation activities in the district (Adcock, Haseltine & Winkler, 1997). Generally speaking, READ is a relational database which provides detailed student achievement data together with context and input information at the various levels of students, classrooms, teachers and schools. Technically speaking, READ is a research office data mart[3] designed to provide Sufficient Statistical Matrix (SSM) data files that fulfill the data modeling requirements of multi-level analysis (e.g., HLM, SEM, AMOS, and LISREL).

For the READ system, the data element definitions pertain to different units of measure, i.e., individual, classroom, school, program, and district. These data elements, and their concomitant definitions, also serve many cohort level studies through simple derivations and translations.

For school reconstitution data analysis, the core classroom teacher is the primary unit of measure. The standardized READ definition for a core teacher is:

> A **core teacher** is a school-based, certified or provisionally certified classroom teacher employed on the last day of the school year and who has the assigned responsibility to provide ***students*** instruction and assign course grades in one or more of the core academic subject areas of language (including reading and English), mathematics, science, or social studies.

The READ system core secondary school teacher is determined in a straightforward manner from individual student course records. Because PGCPS does not use a similar computerized course grading system at the elementary level, determining who are the elementary students' core teachers is more problematic. Each Spring, REA administers a *Student-Teacher-Subject Survey* to all elementary schools in the district. This survey captures each elementary grade students' teacher(s) for reading, mathematics, social studies and science from lists of students provided by

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[3] A data mart is a departmental-sized data warehouse which contains a subset of an enterprise's overall evaluation support data of interest to the particular department (e.g., research office).

REA. The students' core teacher records are merged with personnel data to yield the follow data elements for analysis:

Teacher college training is the college academic training index of the core teacher on a seven-point scale: 1=Bachelors, 2=Bachelors+30 course credit hours (cch), 3=Masters/Equivalent, 4=Masters+15(cch), 5=Masters+30(cch), 6=Masters+60(cch), 7=Doctorate.

The **teacher service years at the school** is the total number of years that the *core teacher* was employed at the "event" school based on their most recent occurrence of continuous employment at that school. Only the last continuous belonging period was considered.

The **teacher service years in the system** is calculated as the average total number of years that core teachers have been employed as teachers (provisional or certified) in the system based upon their most recent occurrence of continuous employment in the system. Only the last continuous belonging period was considered.

The **teacher years of experience** is the total number of years of teaching credit assigned regardless of location (i.e., in or out of the district). These do not have to be continuous years of teaching employment.

The **teacher certification status** is the instructional certification type achieved by the core teacher on a six-point scale: 1=Provisional Without-Degree (Voc-Tech); 2=Provisional With Degree; 3=Resident Teacher; 4=Standard Professional-I; 5=Standard Professional-II; and 6=Advanced Professional.

The **teacher certification area** is the discipline(s) or specific subject area(s) in which a core teacher has been certified to instruct based upon documented academic training and/or test performance. The core teacher READ record contains as many certification area fields as the teacher has areas/fields of certification.

As developed in previous sections, a school's class size statistic is important to the evaluation of school reconstitution reform. The READ system class size statistic is actually a "constructed class size" count, sometimes referred to as a *student-core teacher ratio* count in the literature. This statistic is calculated from the total number of students divided by the "school level count of core teachers." The school level count of core teachers is itself a derived score based upon either the observed teacher count (via elementary Spring survey or secondary student course records) or the Pupil Accounting Class report, whichever count is the larger. This method assures that the READ school number core teacher count reflects the individual classroom instructional situation employed by each school site.

In sum, the school's constructed class size is the end-of-year student enrollment divided by the determined school number of core classroom teachers for each school. This *student-core*

teacher ratio calculation usually yields a larger class size number than the other class size calculations seen in the literature, but as Ferguson (1991) admits, the other calculations are prone to underestimation because they include more than core teachers in the denominator. The standardized READ definition for a school's class size is:

> The **class size** is the total number of ***students*** enrolled on the last day of the school year divided by the derived school number of ***core teachers*** employed on the last day of the school year for each elementary school.

Table 1 lists the student, teacher, and school level variables which may be considered fundamental to any evaluation of the impact of school reconstitution reform. Specifications for "student" and "teacher" are provided in order to anchor the list of school input factors that are the subject of this paper. Specifically, Table 1 presents the delineated variable definitions for student, teacher and school level variables, the variable coding schemes for individual records, the computational algorithms for summarizing school level scores, and related scaling parameters and conditions. It is the position of the authors that school district directors of evaluation should provide at least this level of specificity in the development of their evaluation data set to meet standards of reproducibility and lend confidence to the information yielded by their analysis.

Table 1

Target Data for Evaluating School Reconstitution
List of Student, Teacher and School Level Variables

Variable	*Definition*	*Comment*
Student	A **student** is a person who is enrolled in PGCPS for at least one day, and has an enrollment record containing all of the following: a valid student ID number, a first and last name, a valid race code, a valid gender code, a date of birth.	"Student" is a *Research, Evaluation and Assimilation Database* (READ) warehouse system data element. For evaluation purposes, **student** is often conditionally defined in terms of the study in question (i.e., in terms of a year cohort, the student's teacher, school, program, course, test, etc.).
Teacher Level Variables		
Teacher	A **core teacher** is a school-based, certified or provisional certified classroom teacher employed on the last day of the school year and who has the assigned responsibility to provide ***students*** instruction and assign course grades in one or more of the core academic subject areas of language (including reading and English), mathematics, science, or social studies.	**Core teacher** is a READ system data element. Depending on the nature of an evaluation study, the number of core teachers for an entity (e.g., school, program, or year cohort) can be either observed or derived from other accounting sources.
Teacher College Training	The academic training index of the core teacher on a seven point scale: 1=Bachelors, 2=Bachelors+30 course credit hours (cch), 3=Masters/Equivalent, 4=Masters+15(cch), 5=Masters+30(cch), 6=Masters+60(cch), 7=Doctorate.	Data source is Personnel Office college training code for individual teachers.

Variable	*Definition*	*Comment*
Teacher Certification Status	The **teacher certification status** is the instructional certification type achieved by the core teacher on a six point scale: 1=Provisional W/O-Degree (Voc-Tech); 2=Provisional With-Degree; 3=Resident Teacher; 4=Standard Professional-I; 5=Standard Professional-II; and 6=Advanced Professional.	Data source is Personnel Office college training code for individual teachers.
Teacher Certification Area	The **teacher certification area** is the discipline(s) or specific subject area(s) which a core teacher has been certified to instruct based upon documented academic training and/or test performance. The core teacher READ record contains as many certification area fields as the teacher has areas/fields of certification.	Data source is Personnel Office college training code for individual teachers.
Teacher Service Years School	The total number of years that the individual core teacher was employed at the "event" school. Years of experience operationally defined as "belonged" to that school based upon their most recent occurrence of continuous employment in that school.	Only the last continuous "belonging" period in the "event" school is considered. Data source is summarized Personnel Office records. An "event" school is location of interest to the evaluation study.
Teacher Service Years in System	The **teacher service years in the system** is calculated as the average total number of years that core teachers have been employed as teachers (provisional or certified) in the system based upon their most recent occurrence of continuous employment in the system.	Data source is Personnel Office for individual teachers. Only the last continuous belonging period is considered
Teacher Service Experience	The **teacher years of experience** is the recorded total number of years of teaching credit assigned for teaching regardless of location.	Data source is Personnel Office. The sum of years includes all teaching experience (provisional or certified) in any approved educational setting (private or public).

Variable	*Definition*	*Comment*
School Level Variables		
School Level Student Count	The **school level student count** is the number of enrollees *belonging* to a school site on a given day, usually on the last day of the school year or at some specified official count day (e.g., 1st day of testing or a semester or quarter).	For evaluation purposes, the school student count is sometimes further prescribed with conditions such as the tally in tested grade levels or in grades one or higher.
School Level Teacher Count	The **school level teacher count** is a derived tally of core teachers based upon either the observed teacher count (via Spring survey of teachers at the middle school level or analysis of student course records at the secondary school level) or the Pupil Accounting Class report, which ever count is the larger. This method assures that the READ school number core teacher count reflects the individual classroom instructional situation employed by each school site.	Deriving the teacher count for school from a variety of sources assures that the READ school number core teacher count reflects the individual classroom instructional situation employed by each school site.
School Level Class Size	The **school level class size** is a constructed class size statistic derived from the total number of students enrolled on the last day of the school year divided by the school teacher count.	"School Teacher Count" is a READ-defined data element that represents the number of "classroom teachers" at a school site. Because "School Teacher Count" is used in the denominator, this constructed class size for each school is a robust estimate of each school's average instructional unit, thus an improvement over the student-teacher ratio typically used in the literature (Ferguson, 1991).

Variable	*Definition*	*Comment*
School Level Teacher College Training	The **school level teacher college training score** is the mean of the academic training index of the core teacher *belonging* to the school site on the last day of the school year. Each core teacher is assigned an academic training index score on a seven point scale: 1=Bachelors, 2=Bachelors+30 course credit hours (cch), 3=Masters/Equivalent, 4=Masters+15(cch), 5=Masters+30(cch), 6=Masters+60(cch), 7=Doctorate.	Data source is Personnel Office college training code for individual teachers.
School Level Teacher Certification Status	The **school level teacher certification status** is the proportion of the core teaching *belonging* to the school site on the last day of the school year that have Standard Professional-I instructional certification, or higher.	The school teacher certification status is derived as the mean of dichotomously coded teacher status: Provisional = 0, and Standard (or higher) = 1.
School Level Teacher Service Years School	The **school level teacher experience at school site** is the mean total number of years that the core teachers *belonging* to the school site on the last day of the school year were employed as teachers (provisional or certified) at the school site.	Only the last continuous "belonging" period in the "event" school is considered. Data source is summarized Personnel Office records. An "event" school is location of interest to the evaluation study.
School Level Teacher Service Years in the System	The **school level teacher experience in the system** - is the mean total number of years that the core teachers *belonging* to the school site on the last day of the school year were employed as teachers (provisional or certified) in the system based upon their most recent occurrence of continuous employment in the system.	Only the last continuous "belonging" period in the system is considered based on most recent hire date. Source is summarized Personnel Office data.
School Level Teacher Service Experience	The **school level teacher years of experience** is the recorded sum years of teaching credit assigned for teaching (provisional and certified) regardless of location. Does not have to be continuous years of teaching employment.	Source is summarized Personnel Office data.

EXAMPLE RESULTS

Table 2 presents descriptive analysis results from a previous 1994-95 effective schools study of 120 elementary schools in the Prince George's County Public Schools. These results for 16 variables include four of the school level input variables discussed in the previous data section: "Class Size," "Teacher College Training," "Teacher Service Years (at school site)," and "Teacher Service Years in PG System." The results for these school level input variables were computed in conformance with the data specifications provided in Table 1.

All reported results for the 16 variables listed in Table 1 are based on school-level aggregated values. For each variable considered, the minimum and maximum school-level values are reported in addition to the system average based on the unweighted school values. For example, the first listed variable, "class size", indicates that there was one school with a mean teacher/student enrollment ratio of 16.8 to 1, that the school with the largest mean "class size" ratio was 31.9 to 1, and that the system average "class size" ratio was 25.6 to 1. Similar information is reported for all 16 variables listed.

Table 2

Value-Added Assessment Study For 1994-95 School Year
Descriptive Analysis Results for Elementary School Level Variables [a]

	N	Minimum	Maximum	Mean	Std. Deviation
Class Size	120	16.8	31.9	**25.58**	3.95
Teacher Cost Per Student	120	1165	2492	**1607**	271
Enrollment MOBILITY: School (Days NOT enrolled in MSPAP school for Past 3 years)	116[b]	43.22	277.20	**136.00**	38.11
Enrollment MOBILITY: System (Days NOT enrolled in PG system for Past 3 yrs)	120	14.28	119.56	**59.97**	21.36
% of MSPAP Examinees African-American	120	18.28	100.00	**72.03**	22.47
Mathematics MSPAP Scale Score	120	456.98	551.70	**497.23**	19.47
Reading MSPAP Scale Score	120	466.32	529.73	**495.99**	12.76
Science MSPAP Scale Score	120	456.94	540.60	**497.50**	17.06
% Poverty Among MSPAP Examinees	120	7.08	96.00	**43.65**	20.55
School Performance Index	120	22.3	87.1	**45.45**	14.77
% of MSPAP Examinees TAG	120	1.69	75.47	**15.02**	11.70
Teacher Days Absent in SY95	120	5.00	22.39	**11.37**	2.93
Teacher College Training (1-7 scale)	120	1.33	3.59	**2.18**	.36
Teacher Salary	120	31914	51015	**40238**	3989
Teacher Service Years at MSPAP School	117[c]	2.38	12.78	**6.97**	2.27
Teacher Service Years in PG System	120	4.06	22.00	**11.49**	3.90

a. See school level variable definitions in Table 1.

b. Four schools deleted from analysis because they provided less than three years of enrollment opportunity (i.e., "combination" school with nonregular grade level structure or new schools).

c. If schools were opened after the 1992-93 school year they were deleted from this computation due to truncated service opportunity.

Table 3 displays the overall summaries of the relationships between 14 of the school level variables from the 1994-95 effective schools study. These correlation results are presented as an example of the degree to which school input variables and school contextual variables are associated with student achievement when there is no statistical control or higher level modeling analysis of the variables considered. The point here is that simple, one-dimensional analysis results must be interpreted cautiously. For example, the correlation between class size and the schools' average reading achievement is .27. This positive correlation indicates that larger classes tend to have higher reading achievement than smaller class sizes --- contrary to prevailing beliefs.

Although the relationships indicated in Table 3 are accurate they can be misleading or even counterintuitive when evaluating schools and setting school policy. For example, the positive correlation between class size and reading achievement does not take into account the fact that other variables (related to class size) may be causing the increased achievement rather than class size itself. For example, in Table 3 we see that larger classes have teachers with more years experience (r = .38 for school and .42 for system years), higher levels of college training (r = .19) and with larger numbers of talented and gifted (TAG) students (r = .26). Because of the **uncontrolled confounding influences** of other variables present in these simple correlation results, concluding that higher class sizes improve student learning might be inaccurate. The point is that having "good data" is not enough, directors of evaluation must be careful to employ appropriate analysis methods that provide more resolution and filter out the influences of ancillary variables.

Adcock and Sipes (1997) analyzed the 1994-95 data set with a multilevel design using HLM analysis, which simultaneously considers school-wide and individual student factors. This analysis revealed that Class Size was **negatively related** to Reading scale score. That is, the multilevel HLM analysis revealed that the relationship between class size and student achievement had actually changed directions (from a positive to a negative relationship) from that obtained with simple correlational analysis. The advantage of this multilevel design analysis is that much of the variability in the reading scores that is due to differences in students levels of poverty and student mobility can be removed through the HLM statistical analysis technology. This statistically significant relationship is consistent with prevailing literature that smaller class sizes benefit student performance.

Table 3

Pearson Correlation Analysis Results For MSPAP Reading Performance And School Level Descriptive Variables

	Reading MSPAP Scale Score	% Poverty Among MSPAP Examinees	% of MSPAP Examinees African-American	Enrollment Mobility: School	Enrollment Mobility: System	Teacher Cost Per Student	Teacher Days Absent in SY95	"Class Size"	Teacher Service Years at MSPAP School	Teacher Service Years in PC System	Teacher College Training	Teacher Salary	% of MSPAP Examinees TAG	School Performance Index
Reading MSPAP Scale Score	1.00	-.67**	-.54**	-.44**	-.32**	-.02	.06	.27**	.29**	.39**	.40**	.43**	.52**	.92**
% Poverty Among MSPAP Examinees	-.67**	1.00	.47**	.61**	.42**	.20*	-.11	-.41**	-.30**	-.37**	-.29**	-.39**	-.50**	-.58**
% of MSPAP Examinees African-American	-.54**	.47**	1.00	.40**	.23*	.33**	-.05	-.56**	-.38**	-.46**	-.38**	-.45**	-.43**	-.56**
Enrollment Mobility: School	-.44**	.61**	.40**	1.00	.70**	-.01	-.06	-.24**	-.30**	-.40**	-.37**	-.45**	-.37**	-.40**
Enrollment Mobility: System	-.32**	.42**	.23*	.70**	1.00	.04	-.01	-.17	-.04	-.25**	-.22*	-.26**	-.39**	-.29**
Teacher Cost Per Student	-.02	.20*	.33**	-.01	.04	1.00	.01	-.82**	.05	.11	.27**	.21*	-.16	-.01
Teacher Days Absent in SY95	.06	-.11	-.05	-.06	-.01	.01	1.00	.10	.18	.24**	.17	.21*	.14	.00
"Class Size"	.27**	-.41**	-.56**	-.24**	-.17	-.82**	.10	1.00	.38**	.42**	.19*	.37**	.26**	.22*
Teacher Service Years at MSPAP School	.29**	-.30**	-.38**	-.30**	-.04	.05	.18	.38**	1.00	.83**	.51**	.79**	.09	.23*
Teacher Service Years in PG System	.39**	-.37**	-.46**	-.40**	-.25**	.11	.24**	.42**	.83**	1.00	.68**	.94**	.19*	.32**
Teacher College Training	.40**	-.29**	-.38**	-.37**	-.22*	.27**	.17	.19*	.51**	.68**	1.00	.81**	.25**	.36**
Teacher Salary	.43**	-.39**	-.45**	-.45**	-.26**	.21*	.21*	.37**	.79**	.94**	.81**	1.00	.22*	.37**
% of MSPAP Examinees TAG	.52**	-.50**	-.43**	-.37**	-.39**	-.16	.14	.26**	.09	.19*	.25**	.22*	1.00	.58**
School Performance Index (MSPP: SY95)	.92**	-.58**	-.56**	-.40**	-.29**	-.01	.00	.22*	.23*	.32**	.36**	.37**	.58**	1.00

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

CONCLUDING REMARKS

The school reconstitution challenge for school district evaluation directors is a function of two things: the question being asked and the nature of the recorded data. In the case of evaluating school reconstitution impact, this paper makes a case for broadening the question from "student test gains" to an assessment of school input variables that are the targeted for reconstitution, i.e., teachers and class size.

Specifying a more robust analysis model that includes school input variables, unfortunately, increases the challenge for evaluation directors to delineate, collect and prepare evaluation quality data for the variables in question. This paper provides detailed data specifications for populating a school reconstitution analysis model with student, teacher and school level variables.

Finally, this paper provides example results of some of the school input variables of interest. The presented results revealed the need for directors of evaluation to use an appropriate level of analysis to guard against misinterpretation of findings. This paper introduced the topic of multilevel evaluation models which account for student, school contextual and school input variables in their natural settings. The authors hope to have communicated that no matter what the accountability demands are for reconstituted schools, the evaluation methods employed can not make up for faulty analysis model or bad data.

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